

Project Description and Cost Estimates

Alabama Highway 59 Adaptive Traffic Signal System

Beach Boulevard (Alabama Highway 182) to Foley Beach Express Foley/Gulf Shores, Alabama

Project Limits: Alabama Highway 59 from Foley Beach Express south to Beach Boulevard (Alabama Highway 182) in the cities of Foley and Gulf Shores, Alabama.

Project Description: The project would include all necessary equipment (hardware) and software required to install an adaptive traffic signal system for Alabama Highway 59 in Foley and Gulf Shores, Alabama to include approximately thirty (30) signalized intersections that currently exist. Currently 13 signalized intersections are within Gulf Shores and 17 are within Foley.

Design Parameters: Design of the adaptive system would include all required hardware (controllers, video detection systems, fiber optic or other broadband communication system, number and location of Traffic Management Centers, project phasing, etc.) and software required (SCATS or Econolite ACS) to result in a fully operational adaptive traffic signal system along Alabama Highway 59 within the project limits. Construction costs estimates, below, were developed and include the following items:

- Mobilization
- Removal of signal equipment, as needed
- Furnishing and installing required signal equipment
- Required traffic signal controller and cabinet upgrades
- Required video detection systems
- Fiber optic splicing and drops, as needed
- Traffic control plans for construction efforts.

It should be noted that the construction cost estimates, summarized below, take into account utilization of video detection cameras that presently exist or planned to be installed in the near term at intersections in Gulf Shores. The construction cost estimates also include costs for fiber optic drops for intersections in Foley.

Project Cost Parameters: An examination of each of the 30 intersections proposed for inclusion in the adaptive traffic signal system was conducted from our knowledge of signal equipment in both Gulf Shores and Foley. Based on that review, we felt the intersections fell into one of four categories based on current conditions and those required to update them to a condition where a fully adaptive traffic signal system would be in place. The following provides a summary description of each of the four intersection classifications as well as a Summary Table of the number of intersections in Foley and Gulf Shores by intersection classification.

Class I Intersection: A Class I intersection is an intersection where the traffic signal has (or will have) the majority of the features which are required for adaptive operation.

Class I intersections have:

- fiber optic connection to a trunk line fiber

- fiber distribution unit and fiber optic patch cords
- an Ethernet switch
- an Ethernet-capable controller
- a controller capable of having adaptive software installed on it
- video (or other type) detection suitable for adaptive traffic operation
- connection to a server with adaptive control software

Work efforts required to bring Class I intersections into adaptive operation include:

- licensing the intersection for adaptive control
- installing adaptive control software on the controller
- developing, implementing, and fine-tuning adaptive programming
- programming video detection zones as required for adaptive operation
- Incidental work including mobilization, traffic control, geometric controls, and construction fuel

Cost to upgrade a Class I intersection to adaptive control is approximately \$50,000 per intersection. Four intersections in Gulf Shores and 0 intersections in Foley are considered Class I intersections.

Class II Intersection: A Class II intersection is an intersection where the traffic signal has (or will have) many of the features which are required for adaptive operation.

Class I Intersections have:

- fiber optic connection to a trunk line fiber
- fiber distribution unit and fiber optic patch cords
- an Ethernet switch
- Ethernet-capable controller
- a controller capable of having adaptive software installed on it
- connection to a server with adaptive control software

Work efforts required to bring a Class II intersection into adaptive operation include:

- licensing the intersection for adaptive control
- installing adaptive control software on the controller
- developing, implementing, and fine-tuning adaptive programming
- installing video (or other type) detection suitable for adaptive traffic operation
- programming video detection zones as required for adaptive operation
- Incidental work including mobilization, traffic control, geometric controls, and construction fuel

Cost to upgrade a Class II intersection to adaptive control is approximately \$65,000 per intersection. Nine intersections in Gulf Shores and 0 intersections in Foley are considered Class II intersections.

Class III Intersection

Class III Intersection: A Class III intersection is an intersection where the traffic signal has (or will have) few of the features which are required for adaptive operation.

Class III intersections have:

- fiber distribution unit and fiber optic patch cords
- an Ethernet switch
- an Ethernet-capable controller

- a controller capable of having adaptive software installed on it
- video (or other type) detection suitable for adaptive traffic operation

Work efforts required to bring Class I intersections into adaptive operation include:

- fiber optic connection to a trunk line fiber
- connection to a server with adaptive control software
- licensing the intersection for adaptive control
- installing adaptive control software on the controller
- developing, implementing, and fine-tuning adaptive programming
- programming video detection zones as required for adaptive operation
- Incidental work including mobilization, traffic control, geometric controls, and construction fuel

Cost to upgrade a Class III intersection to adaptive control is approximately \$75,000 per intersection. Zero intersections in Gulf Shores and 6 intersections in Foley are considered Class III intersections.

Class IV Intersection: A Class IV intersection is an intersection where the traffic signal has (or will have) none of the features which are required for adaptive operation.

Work efforts required to bring Class IV intersections into adaptive operation include:

- fiber optic connection to a trunk line fiber
- fiber distribution unit and fiber optic patch cords
- an Ethernet switch
- an Ethernet-capable controller
- a controller capable of having adaptive software installed on it
- connection to a server with adaptive control software
- licensing the intersection for adaptive control
- installing adaptive control software on the controller
- developing, implementing, and fine-tuning adaptive programming
- video (or other type) detection suitable for adaptive traffic operation
- programming video detection zones as required for adaptive operation
- Incidental work including mobilization, traffic control, geometric controls, and construction fuel

Cost to upgrade a Class IV intersection to adaptive control is approximately \$100,000 per intersection. Zero intersections in Gulf Shores and 11 intersections in Foley are considered Class IV intersections.

The summary table that follows lists the number of intersections in Foley and in Gulf Shores by classification as described above.

SUMMARY TABLE
FOLEY/GULF SHORES ADAPTIVE SIGNAL SYSTEM UPGRADE

<i>Feature Currently Available/Work Already Performed</i>	<i>Class I</i>	<i>Class II</i>	<i>Class III</i>	<i>Class IV</i>
Fiber optic connection to a trunk line fiber	✓	✓		
Fiber distribution unit and fiber optic patch cords	✓	✓	✓	
Ethernet switch	✓	✓	✓	
Ethernet-capable controller	✓	✓	✓	
Controller capable of having adaptive software installed	✓	✓	✓	
Connection to a server with adaptive control software	✓	✓		
Licensing for the intersection for adaptive control				
Adaptive control software installed on the controller				
Developing, implementing, and fine-tuning adaptive programming				
Video (or other type) detection suitable for adaptive traffic operation	✓		✓	
Programming video detection zones as required for adaptive operation				
Incidental work including mobilization, traffic control, geometric controls, and construction fuel				
<i>Number of intersections in Gulf Shores</i>	4	9	0	0
<i>Number of intersections in Foley</i>	0	0	6	11
<i>Cost to Upgrade to Adaptive</i>	\$50,000	\$65,000	\$75,000	\$100,000

Probable Project Costs:*

Utilizing the intersection classifications for both Foley and Gulf Shores we were able to provide a better estimate of cost for each city to bring their signals up to a point where a complete and operational adaptive signal system would be in place across all 30 signalized locations. The graphic which follows represents the results of this cost estimating effort and reflects the distribution of costs to both cities.

Project Cost Summary:

	<u>Gulf Shores</u>	<u>Foley</u>
Pre-Construction Engineering (approx. 7% of construction costs):	\$ 55,000	108,500

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Scope of Work
Baldwin County, Alabama

Construction Cost Estimate:	\$ 785,000	1,550,000
Construction Engineering/Inspection (15% of construction costs):	\$ <u>118,000</u>	<u>232,500</u>
Total Estimated Costs by City	\$ 958,000	\$1,891,000
Total Estimate Project Costs	\$2,849,000	

**Cost estimates do not include any agreements required with communication providers. Fees for use of existing communication systems is assumed to be handled by the cities of Foley and Gulf Shores.*